Meeting of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction

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Item 9 of the provisional agenda
Promotion of capacity building, through international cooperation, in biosafety and biosecurity and for detecting, reporting and responding to outbreaks of infectious disease or biological weapons attacks, including in the areas of preparedness, response, and crisis management and mitigation

Promotion of Capacity Building: Sustainable Laboratories for High Consequence Pathogens

Submitted by Canada and the United Kingdom of Great Britain and Northern Ireland

I. Introduction

1. At the BTWC Meeting of Experts in 2012, the UK submitted a Working Paper (under the Standing Agenda Item on Cooperation and Assistance) on the challenges of capacity building for laboratories in resource-limited scenarios.[1] It concluded that, although preliminary steps had been taken to consider such challenges, there was a pressing need to act to implement appropriate solutions on laboratory biosafety and biosecurity around the world. This would require international leadership, coordination and communication and local engagement.

2. Subsequent reports of Meetings of States Parties noted the value of continuing discussion on the challenges associated with the provision of sustainable biosafety and biosecurity capabilities, including in resource-limited settings, and of developing and

[1] 'Challenges to developing international cooperation and assistance on biosafety and biosecurity: matching resources to reality (BWC/MSP/2012/MX/WP.2)

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implementing appropriate, sustainable and effective laboratory safety and security measures through international cooperation and assistance.[2]

3. The Final Declaration of the Eighth Review Conference also reflected this aspect under Article X, agreeing on the value of working together to promote capacity building in relevant fields, including biological risk management, and affirming that building such capacity would directly support the achievement of the objectives of the Convention. This would require that States Parties seeking to build capacity identify their specific needs and requirements and seek partnerships with others, and that States Parties in a position to do so provide assistance and support.

Chatham House 'Sustainable Laboratories for High- Consequence Pathogens Initiative

4. The 2012 UK Working Paper focussed on the report of a Chatham House International Conference on *Safe and Secure Materials: Matching Resources to Reality,* which identified some key issues and potential solutions. The Chatham House Centre on Global Health Security has continued to address these in its initiative on Sustainable Laboratories for High Consequence Pathogens, which it developed jointly with Public Health England and the UK and Canadian Global Partnership programmes.[3] It aims to engage with the opportunities, requirements and practical challenges involved in working with hazardous biological material in resource-limited settings to improve the sustainability of laboratories and address the potential biosafety and biosecurity capability gaps.

5. Following the initial phases, which focussed on gaining consensus for the concept of sustainable biosafety and biosecurity among key countries, international organisations and the international donor community, the emphasis is now on central/national public health laboratories in West Africa. A small number of such facilities will collaborate in a field phase, focussing on the practical, technical, financial and engineering challenges associated with operating biosafety and biosecurity systems in resource-limited settings.

Sustainable Laboratories Roundtable (Abuja, February 2018)

6. With further support from the Weapons Threat Reduction Program at Global Affairs Canada[4], Chatham House is continuing work in this area through a Project that is exploring "Biosafety & Biosecurity Solutions for Resource-limited Environments". The underlying premise of the effort is that while well-equipped biological laboratories play a critical role in the global campaign to prevent, detect and respond to infectious diseases outbreaks, such facilities are often too complex in design and too costly to build, maintain and sustain in countries with the greatest need (e.g. countries in West Africa). In this regard, the Project seeks to move away from the "one size fits all" approach to labs, and to identify new and innovative solutions (e.g. tangible design and operational adjustments) for biological laboratories to be operated in resource-limited environments.

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[2] BWC/MSP/2012/5; BWC/MSP/2013/5

[3] https://www.chathamhouse.org/about/structure/global-health-security/sustainable-laboratories-high-consequence-pathogens-africa

[4] Global Affairs Canada (GAC)'s Weapons Threat Reduction Program implements Canada's contributions to the Global Partnership (GP) Against the Spread of Weapons and Materials of Mass Destruction (www.gpwmd.com). As 2018 Chair of the now 31-country GP, Canada has identified "sustainable biosafety" as a top priority for collective focus.

7. In this context, a roundtable meeting on 'Sustainable Laboratories for High-consequence Pathogens in Africa: Opportunities, Requirements and Challenges', was convened in Abuja, Nigeria on 6-7 February 2018. The roundtable brought together expertise in communicable disease control and public health, animal health, laboratory operations, biosafety and biosecurity, international security and development; almost half of the participants were working in relevant institutions in Africa. The goal was to explore what African countries would find appropriate in terms of building laboratory capacity, what have been the main challenges so far, and what needs to be done to improve the sustainability of laboratories in the region. A key objective was to identify and prioritise action for making progress. This Working Paper highlights some of the key findings of the roundtable discussions. Further information can be found in the Chatham House Centre on Global Health Security Roundtable Summary.[5]

8. In considering the proposal to adopt an approach based on a local risk assessment, whereby laboratories are appropriately and optimally tailored to the local risks and available resources without compromising biosafety and biosecurity, the roundtable identified three phases in laboratory sustainability: prior assessment and planning; design construction and operationalisation; and training for laboratory sustainability. The main issues were characterised as financial, practical and operational challenges.

9. *Prior assessment and planning:* It was suggested that the process should begin with a situation analysis that considers aspects such as:

- the strategic context: the goals and needs of the health system and the requirement for the laboratory taking into account other current and planned national and regional laboratory capacity, and the country's disease profile;
- existing regulations, standards and policies that would apply;
- national financial resources and government support;
- laboratory workforce capacity;
- the capability to transport biological samples and reagents.

A needs assessment would follow, considering the specific requirements for staff, skills, services, infrastructure and interfaces. This would lead to detailed planning before laboratory design and construction began, and the following key tasks were outlined:

- develop a programme of work based on the situation analysis and needs assessment, and plan how it would fit in with existing or planned public health and veterinary laboratories;
- adopt a tailored risk-based approach;
- financial planning;
- identify roles and responsibilities, including the relationship between funding partners and recipients.

Some examples of other issues to be covered included: workforce planning; maintenance, standards and quality assurance; relevant technologies; sample transportation; laboratory twinning opportunities; sustainability; success metrics; and transitioning to self-sufficiency.

10. *Laboratory design:* Participants agreed that one set of specifications for laboratory design would not satisfy all needs, given the differences in local risk assessments and

[5] Available at: https://chathamhouse.soutron.net/Portal/Default/RecordView/Index/172778

contexts (including available financial and technical resources). Some of the important concepts to address were:

- design for expected programme of work and for sustainability;
- simplified overall design and controls;
- low energy demands;
- appropriate biosafety and biosecurity measures for local risk;
- simple equipment and plant that can be maintained locally;
- consider recirculation of conditioned air and necessity of high-grade filtration;
- security fencing.

11. *Training for laboratory sustainability:* Effective training in all the skills needed to establish, operate and maintain a laboratory was acknowledged to be crucial. It was widely agreed that a 'train the trainer' system and the feasibility of establishing a regional training hub should be explored. Metrics to evaluate the effectiveness of training programmes would be of value.

12. Some constructive lessons to address sustainability that emerged in consideration of the three phases were as follows:

- prepare a business case properly and plan for sustainability from the start;
- clearly identify the purpose of the laboratory at the outset;
- take a risk-based approach to laboratory design and specification, based on local risk assessment and appropriate requirements and standards;
- gain high-level buy-in, ongoing engagement and local ownership, which will be important in transition to self-sufficiency;
- formalised skills development is integral to success;
- keep reviewing fitness for purpose, including reassessing the risks and advances in technology, to increase the likelihood of sustainability.

OIE Consultation on Sustainable Laboratories

13. A similar consultation, also funded by Global Affairs Canada, was convened at the World Organisation for Animal Health (OIE) headquarters in Paris on 1-2 March 2018. The OIE "Consultation on Sustainable Laboratory Biosafety and Biosecurity, which engaged animal health experts from Africa, Asia, Europe, the Caribbean and the Americas, reached similar conclusions to the Abuja roundtable on the issue of capacity building in varying resource settings. The report of the consultation highlighted that sustainable laboratories must be fit for purpose and adapted to the local situation and risks. It may not be practical or necessary to apply the same standards in all settings since the local context, including risks and resources, varies; however, sustainability should not be seen as a means of relaxing or reducing standards. Political buy-in, governance of laboratories and empowerment of laboratory staff would be crucial to the sustainability of a laboratory.[6] Follow up work has been initiated to set in motion a transformative agenda to improve the

[6] available at: http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/OIE_sust_labs_report_final.pdf

sustainability of diagnostic laboratories; this will involve engaging a network of potential innovators and producing a cost/benefit analysis that should convince funders that long term investment in laboratory sustainability is worthwhile.[7]

II. Conclusions and next steps

14. The February roundtable in Abuja identified three work streams that could help make progress on establishing sustainable laboratories for high-consequence pathogens in the Africa region (with recognition that results should be applicable for and transferable to other regions as well). Chatham House will continue work on these work streams in 2018-2019, with funding provided by Global Affairs Canada:

- create a laboratory 'prior assessment tool' to guide discussions between partners interested in establishing a new public health laboratory;
- develop a list of core specifications for sustainable laboratories that would be suitable for risk-based tailoring;
- investigate the appetite for, and feasibility of, establishing a regional laboratory skills training hub in Africa.

15. The initiative described in this Working Paper is a good example of how innovative approaches can be adopted when working cooperatively to promote capacity building in relevant fields. It likewise underscores the value of working in partnership with States Parties in need of support to identify their specific requirements and to address long-term needs in a sustainable manner. The Intersessional Programme 2018-20 provides further opportunities to promote effective action on these requirements. MX1[8] will be able to address relevant issues under a number of its topics, including:

- promotion of capacity building, through international cooperation, in biosafety and biosecurity …;
- development of guidelines and procedures for mobilizing resources …;
- facilitation of education, training, exchange and twinning programs …, particularly in developing countries.

16. Improved operation and utilisation of the assistance and cooperation database established by the Seventh Review Conference and renewed by the Eighth Review Conference could also facilitate international collaboration on the establishment of sustainable laboratories for high-consequence pathogens in resource-limited settings.

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[7] see http://www.oie.int/fileadmin/Home/eng/About_us/OIEnews/NL%202018-06-lab%20sustainability.pdf

[8] Meeting of Experts 1: Cooperation and assistance, with a particular focus on strengthening cooperation and assistance under Article X